



10/077036

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ORIGINALLY FILED4 / 4 formal
drawings
E. Mills
8-2-02

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Parker et al. Examiner: Unknown
Serial No.: 10/077036 Group Art Unit: 2881
Filed: 2/15/02 Docket No.: **SJO919990205US1**
501.314US01

Title: METHOD AND APPARATUS FOR COMPENSATING WAVEFORMS,
SPECTRA, AND PROFILES DERIVED THEREFROM FOR EFFECTS OF
DRIFT

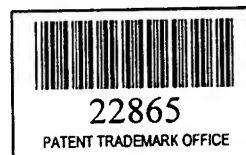
CERTIFICATE UNDER 37 C.F.R. 1.8: The undersigned hereby certifies that this Transmittal Letter and the paper, as described herein, are being deposited in the United States Postal Service, as first class mail, with sufficient postage, in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231 on April 23, 2002

David W. Lynch
Name

Signature

SUBMISSION OF FORMAL DRAWINGS

Assistant Commissioner for Patents
Washington, D.C. 20231



Dear Sir:

Enclosed herewith are 26 sheet(s) of formal drawings for the above-referenced patent application in response to the communication dated April 1, 2002.

Respectfully submitted,

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Date: April 23, 2002

By:

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84

1/26

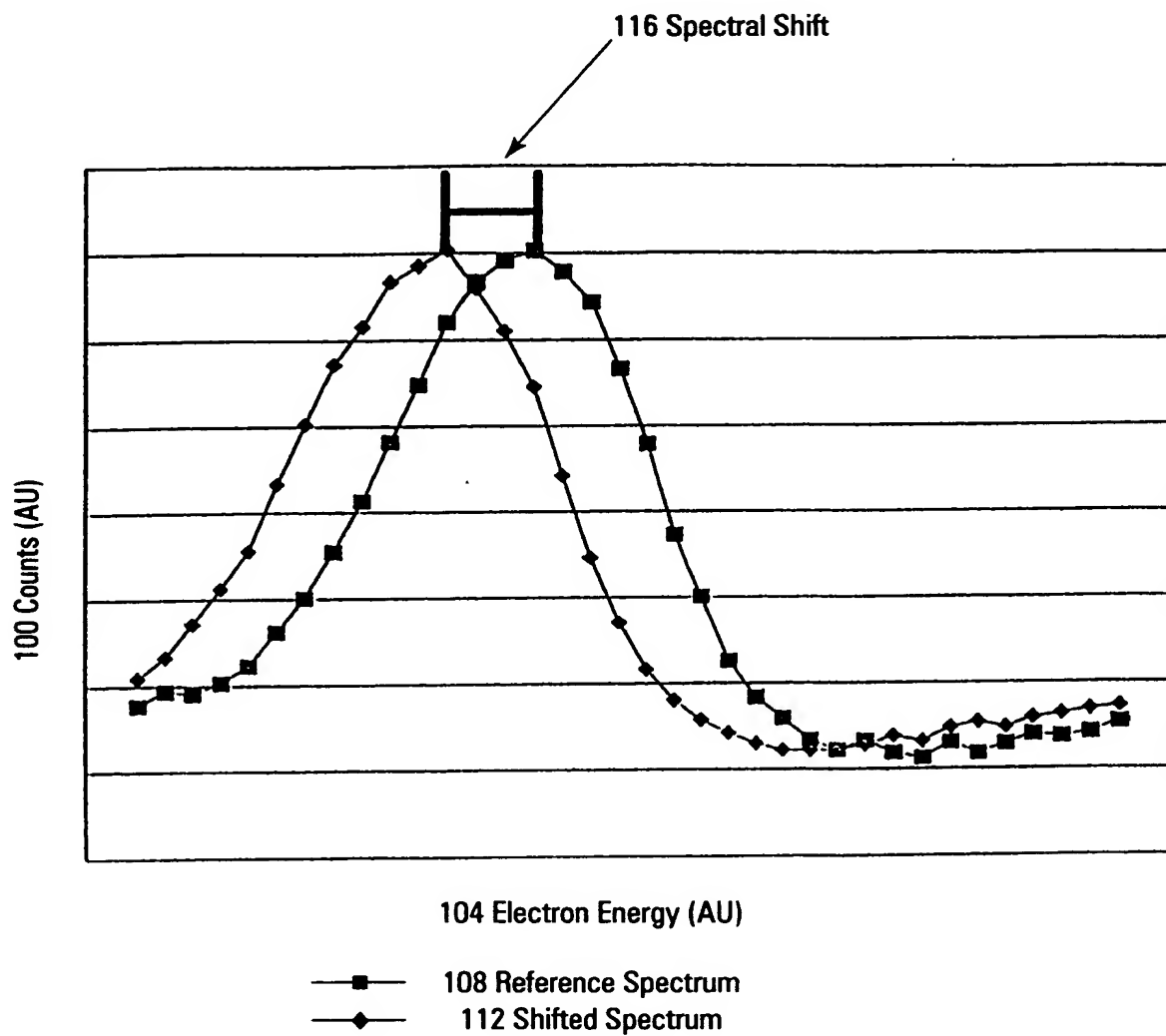


Fig. 1
(Prior Art)

2/26

Spectra for Depth Profile of Charging SiO_2 on Si
 (Si KLL Auger Spectra)

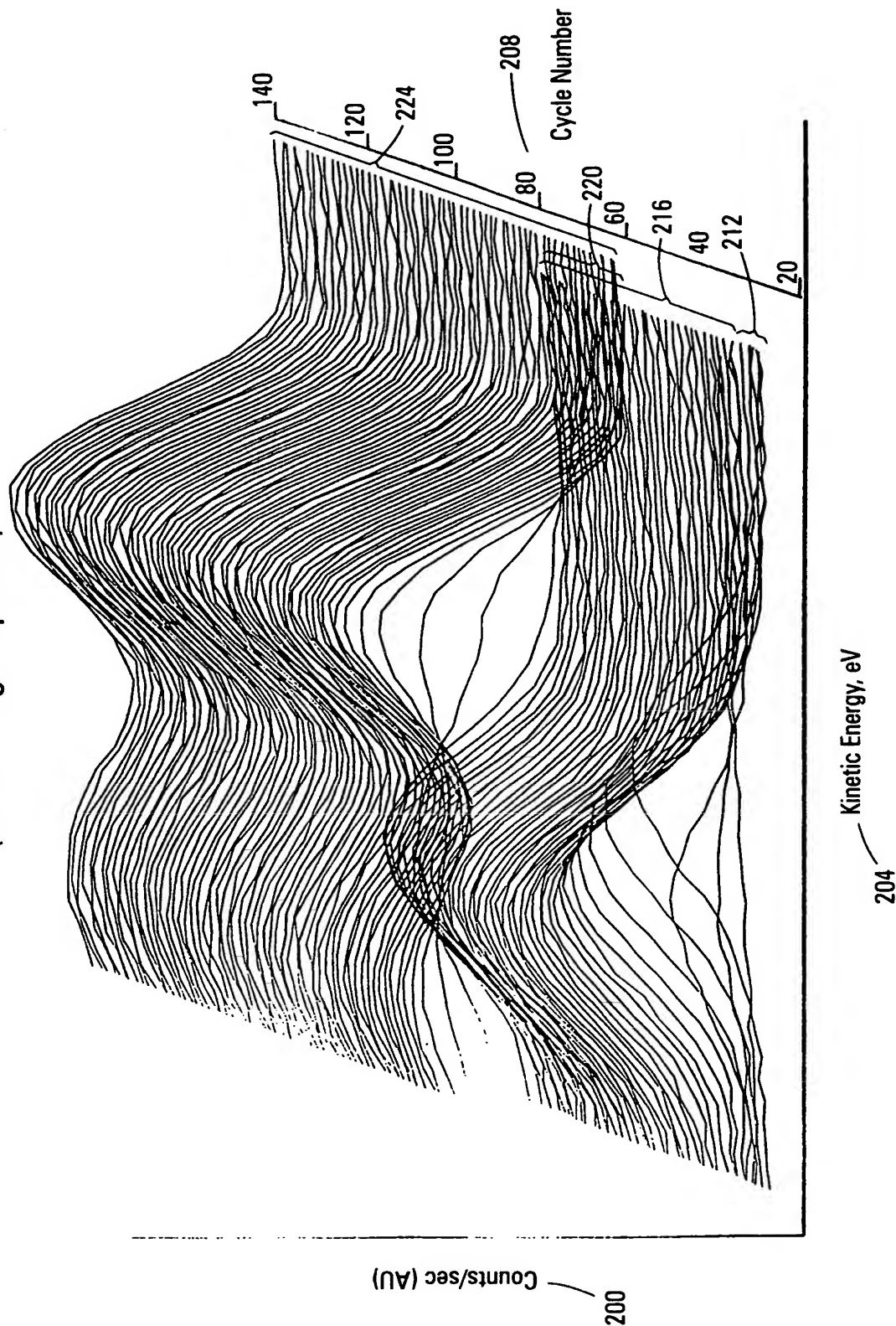


Fig. 2
(Prior Art)

3/26

Profiles of Scaled Target-Factor Weighting Factors from Factor Analysis of Uncompensated Auger Spectra from Charging SiO_2 on Si Substrate

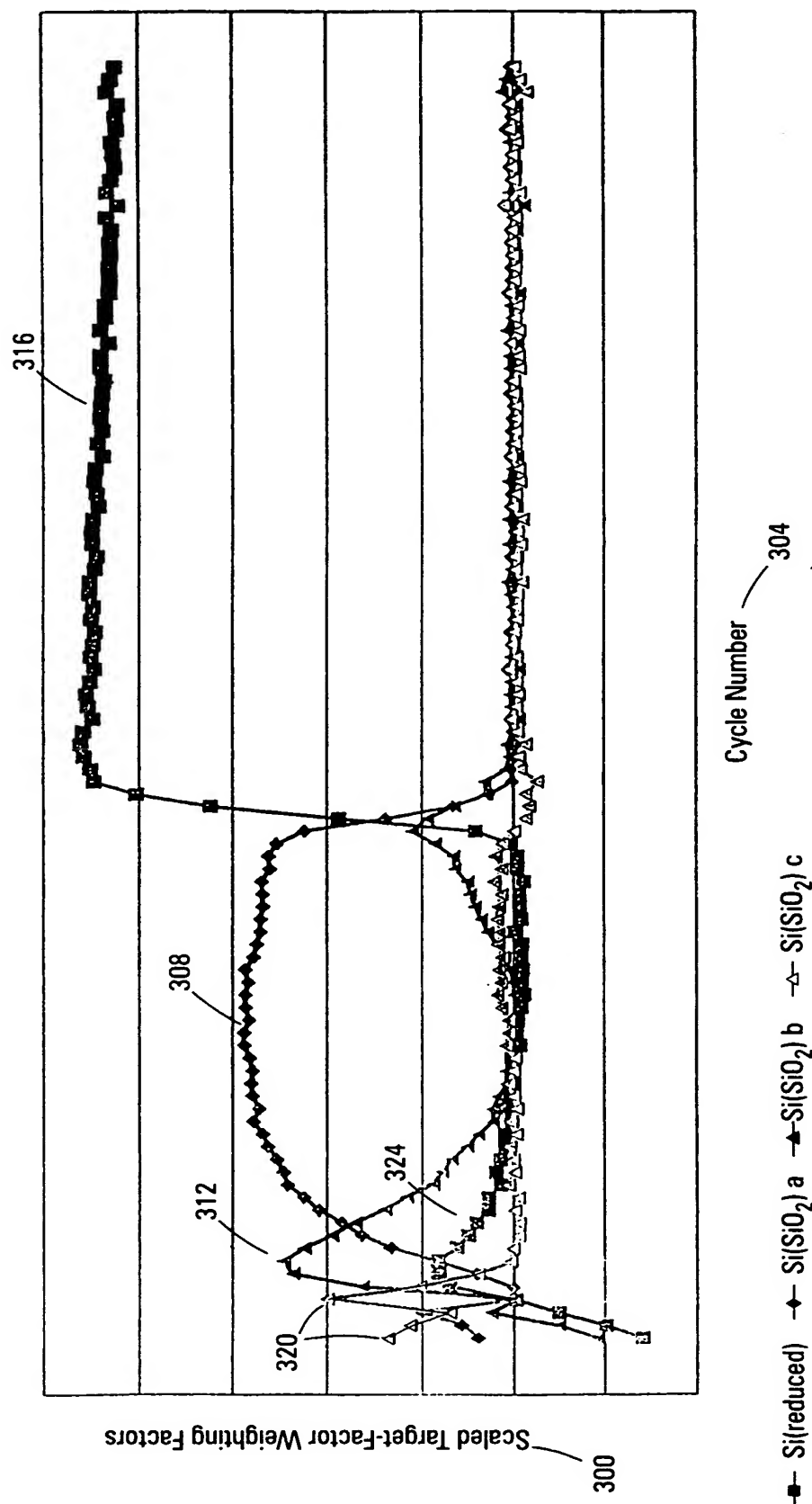
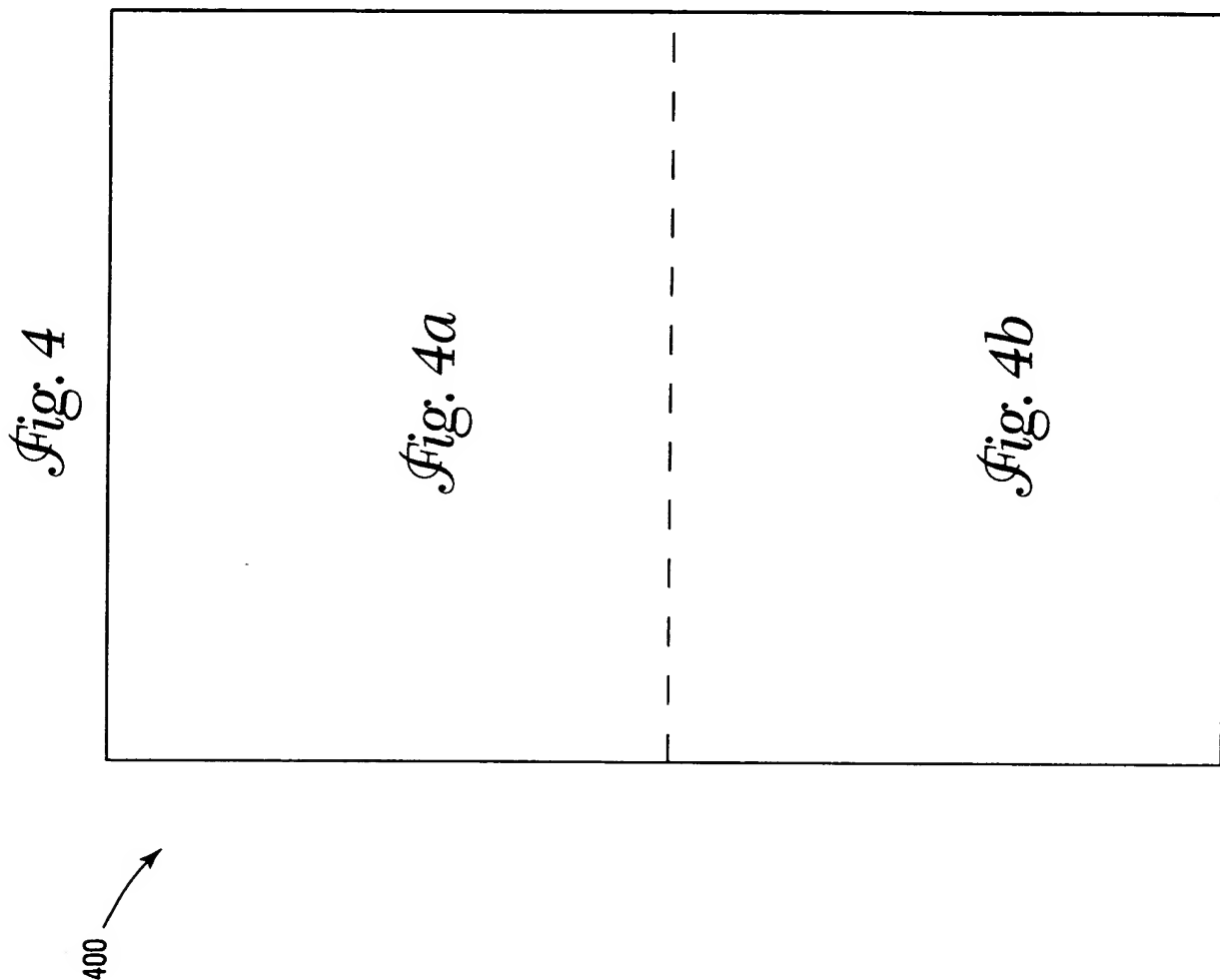


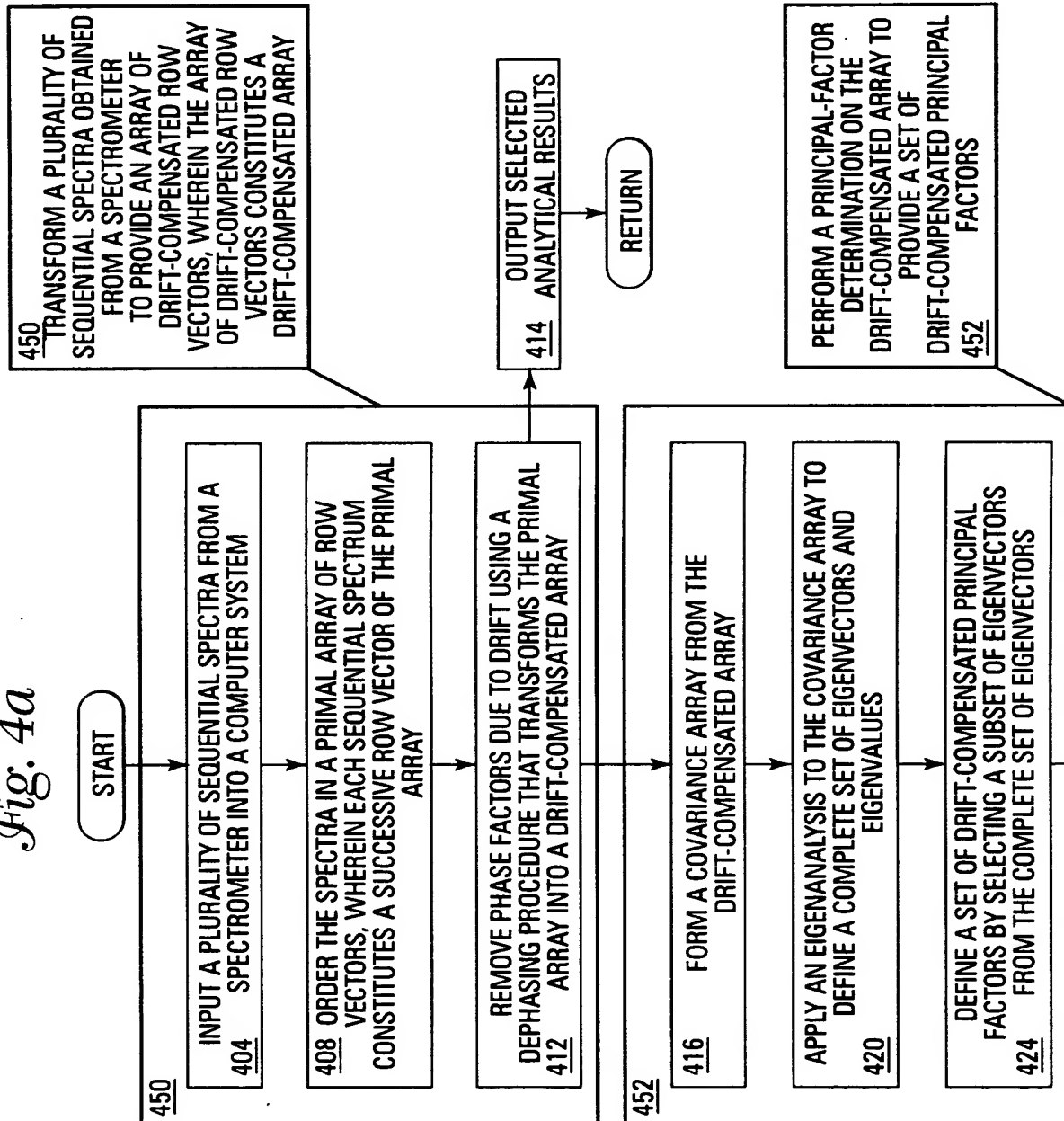
Fig. 3
(Prior Art)

4/26



5/26

Fig. 4a



6/26

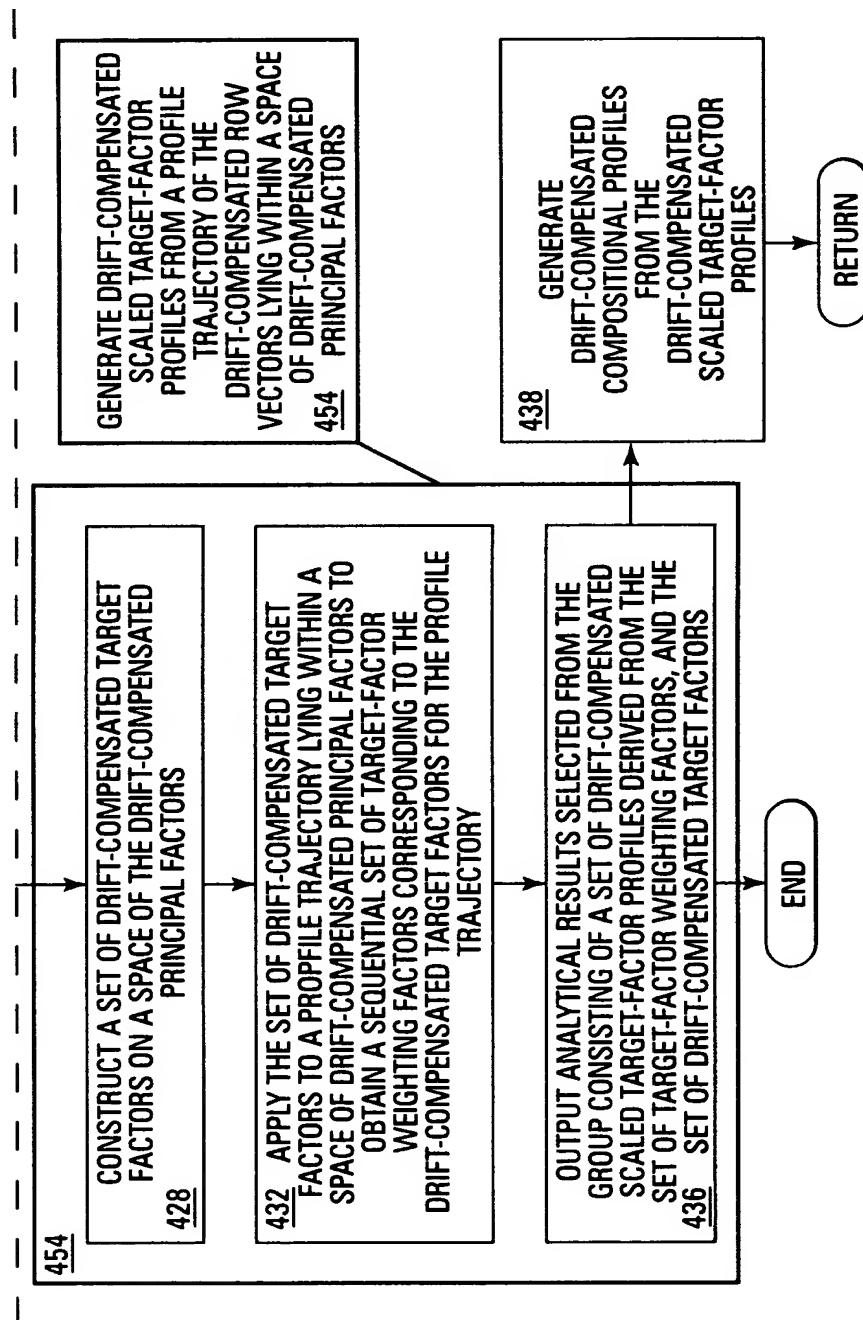
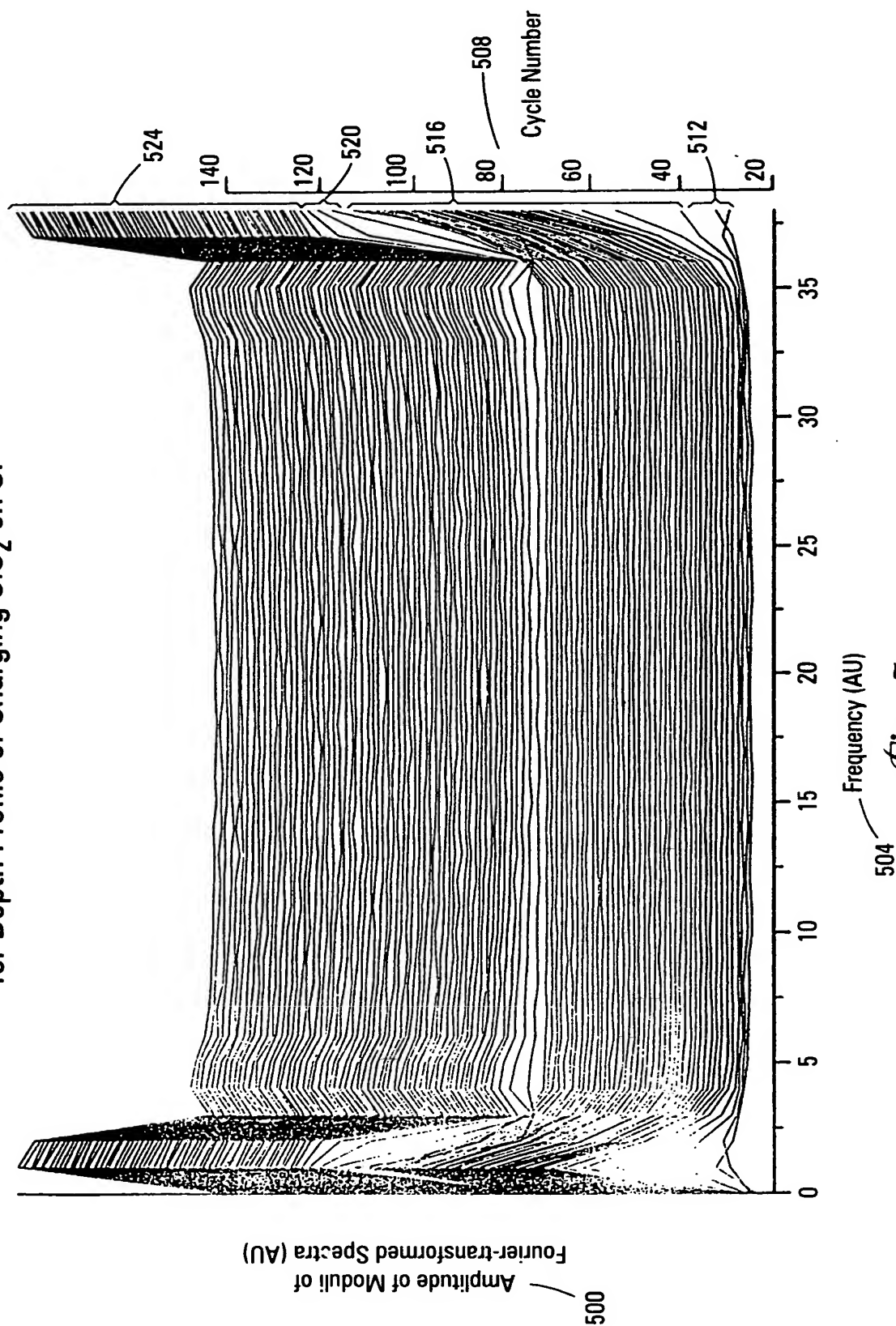


Fig. 4b

7/26

Moduli of Fourier-transformed Spectra for Depth Profile of Charging SiO_2 on Si



8/26

Profiles of Scaled Target-Factor Weighting Factors from Factor Analysis of Moduli of Fast-Fourier-Transformed Auger Spectra from Charging SiO_2 on Si Substrate

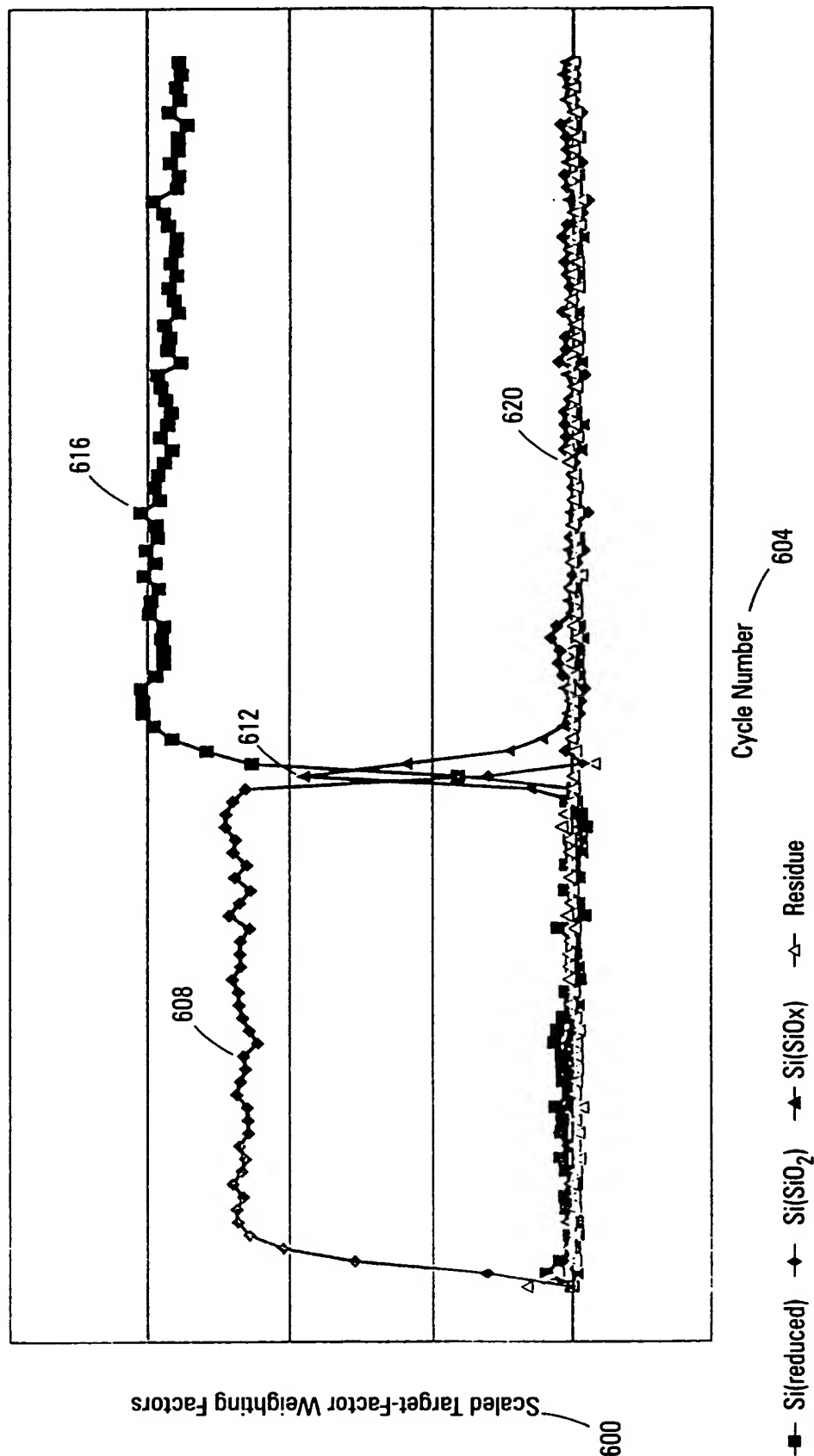


Fig. 6

9/26

Drift-Compensated Spectra Synthesized from Selected Reference Spectra Fit to Primal Spectra for Depth Profile of Charging SiO_2 on Si

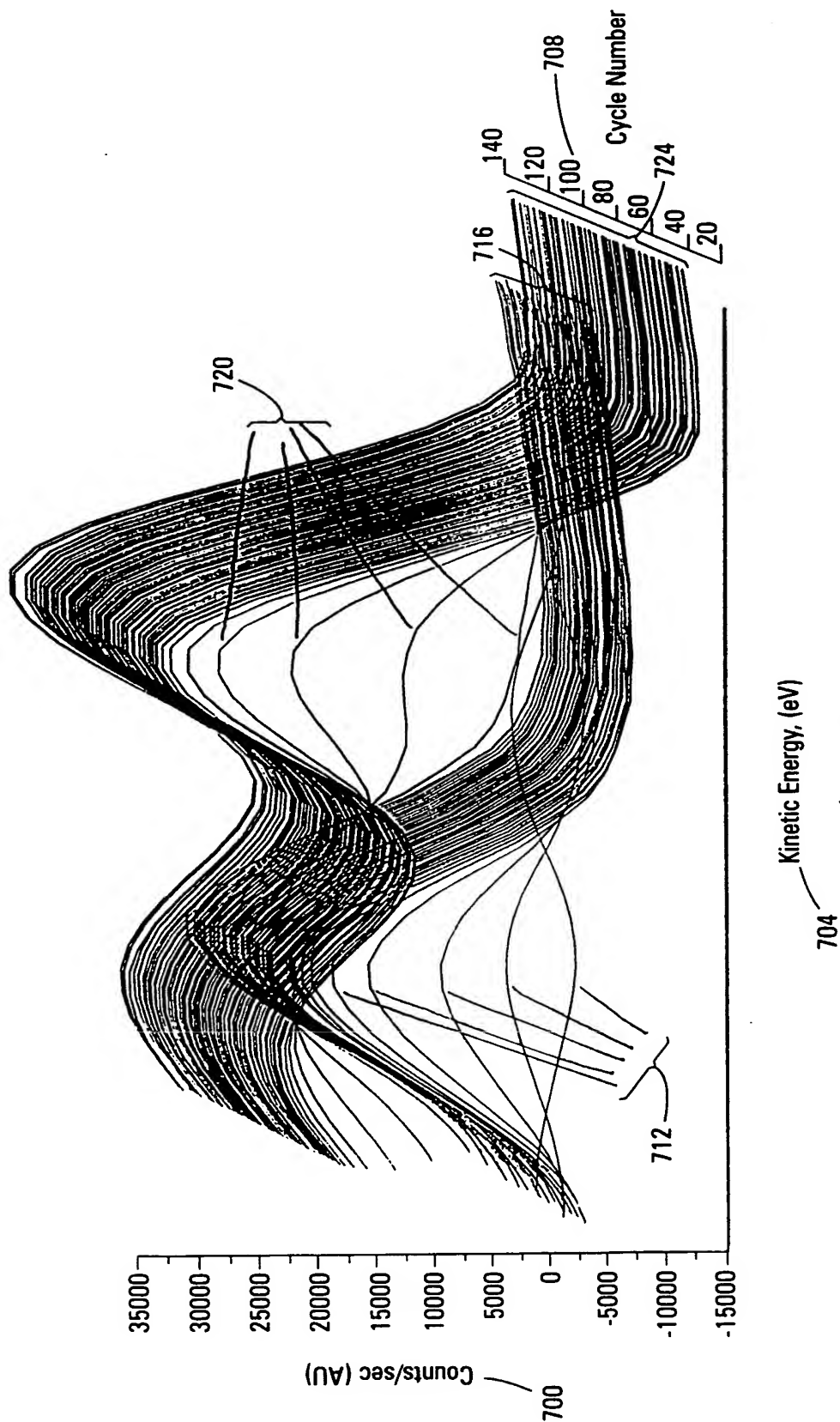


Fig. 7

10/26

Profiles of Scaled Target-Factor Weighting Factors from Nonlinear-
 Least-Squares Fitting of Selected Reference Spectra to Primal Spectra and
 Profile of Principle Residue Weighting Factor from Eigenanalysis of Residues

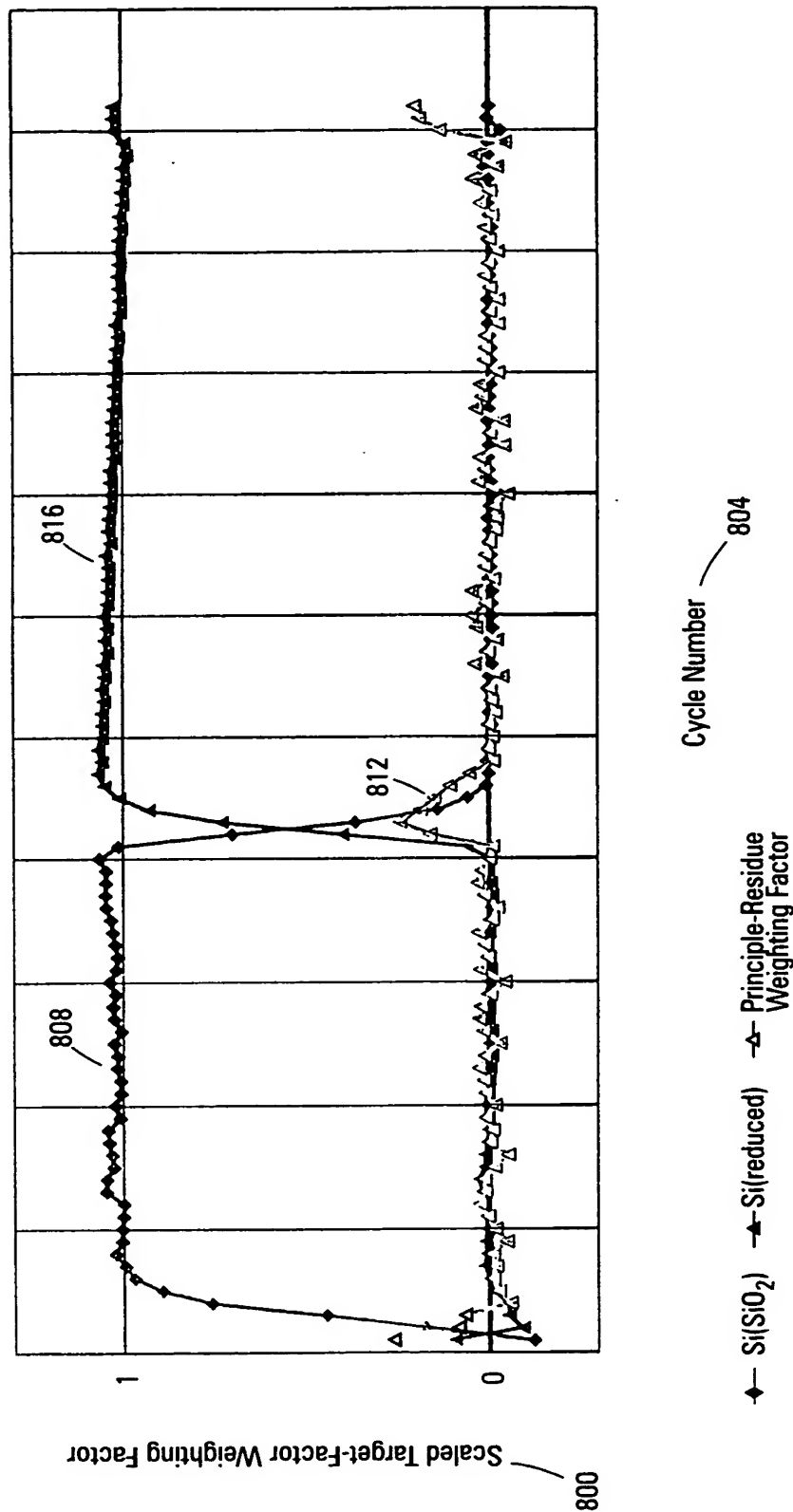
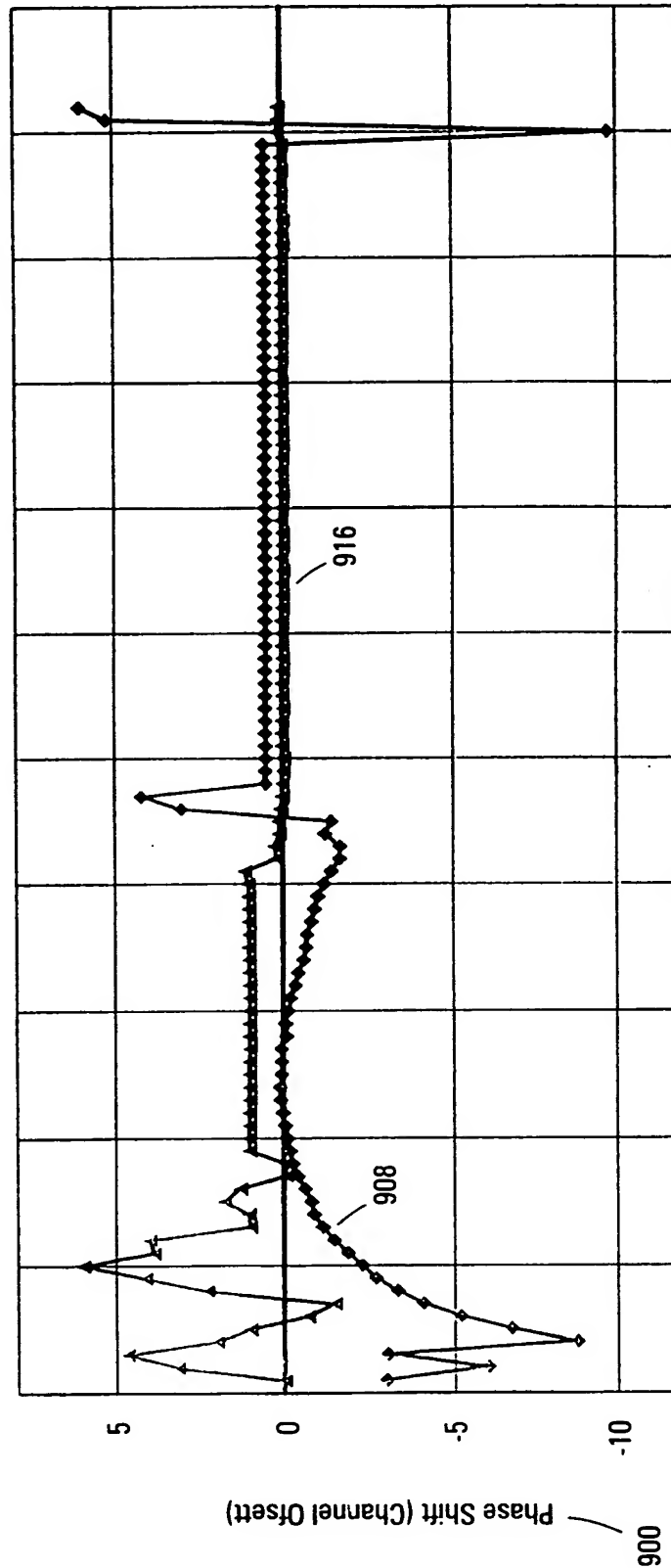


Fig. 8

11/26

Profiles of Phase Factors for Selected Reference Spectra Obtained from Fitting to Primal Spectra



Cycle Number — 904

◆ Si(SiO₂) ▲ Si(reduced)

Fig. 9

12/26

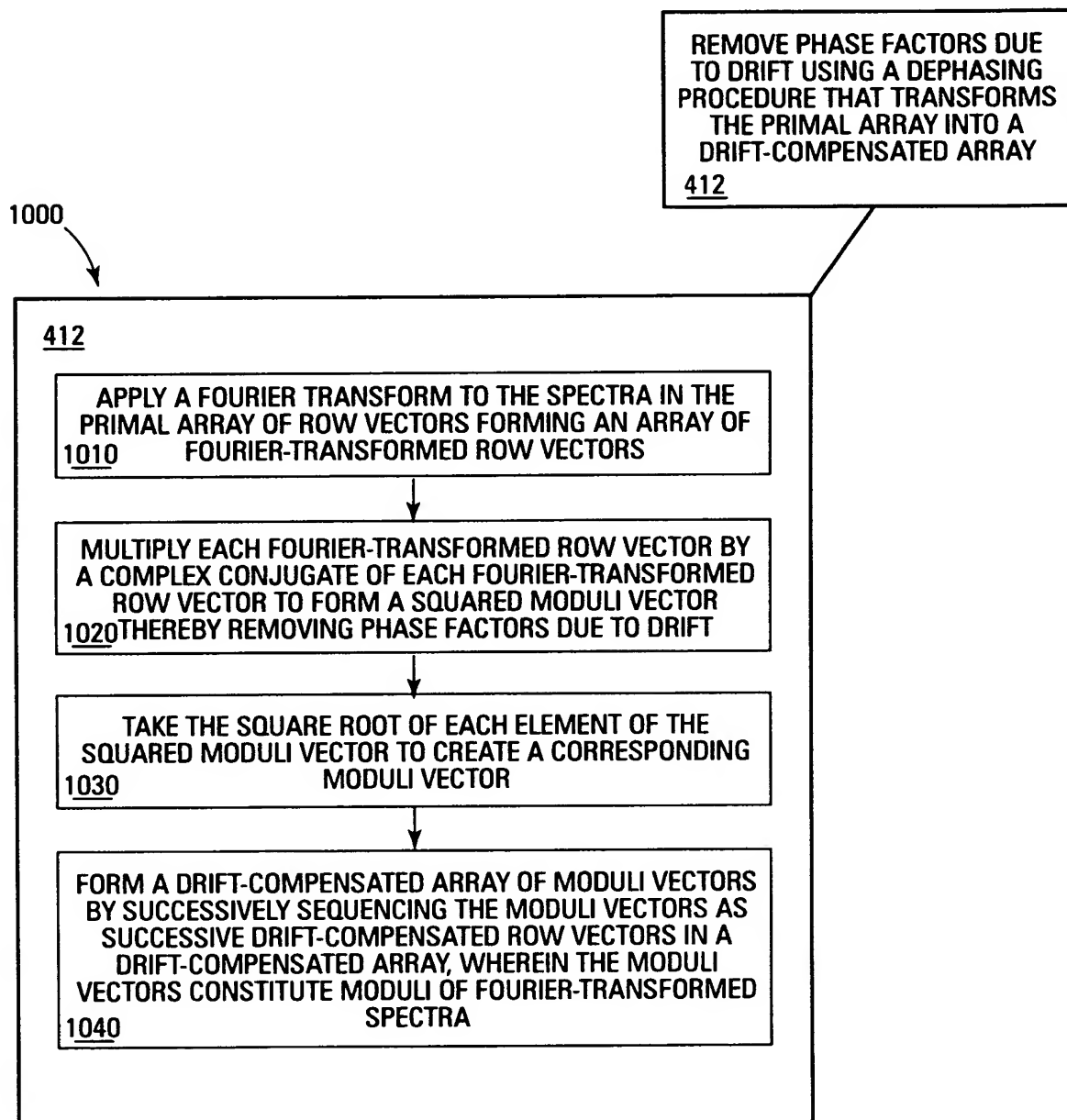


Fig. 10

13/26

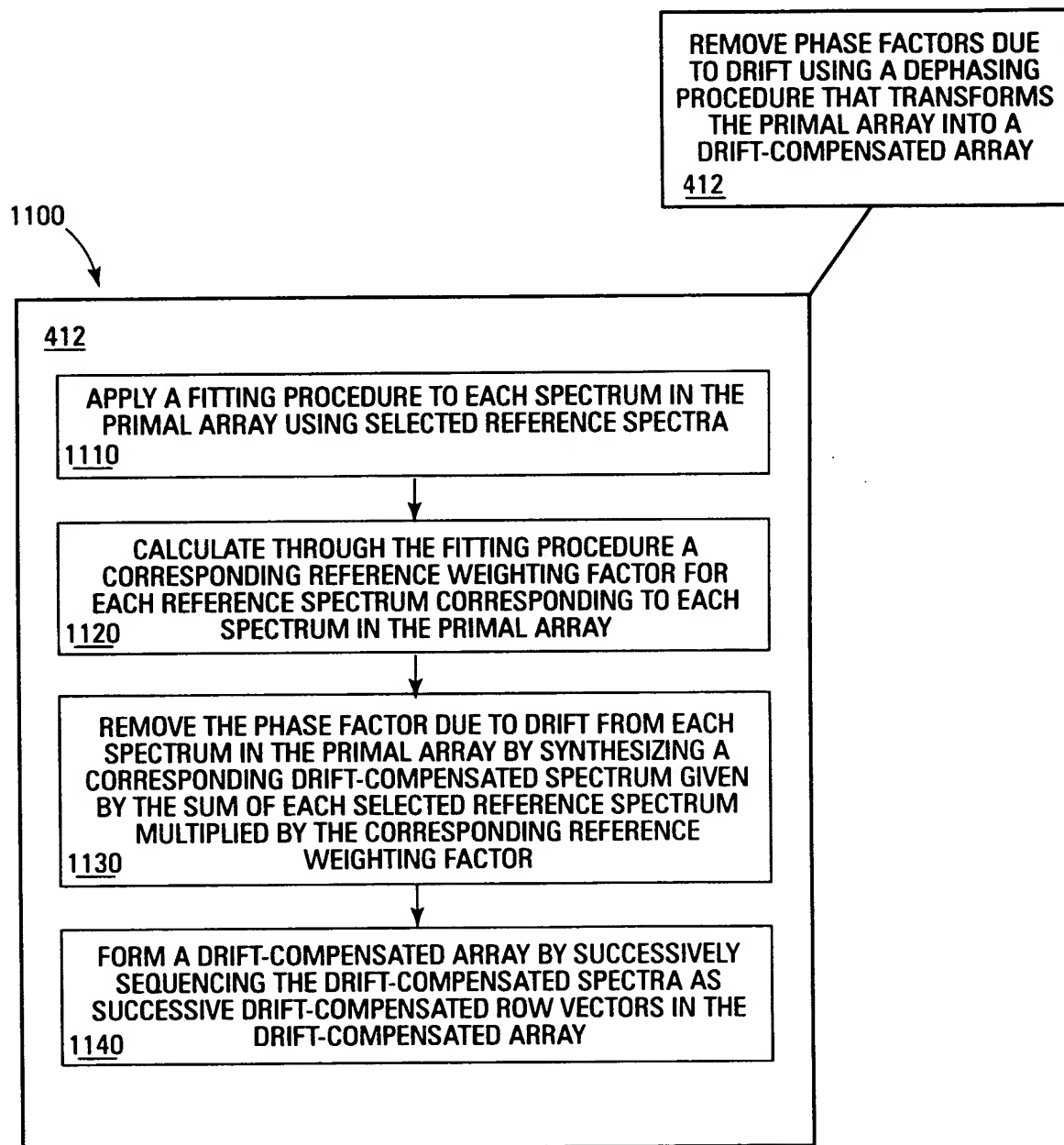


Fig. 11

14/26

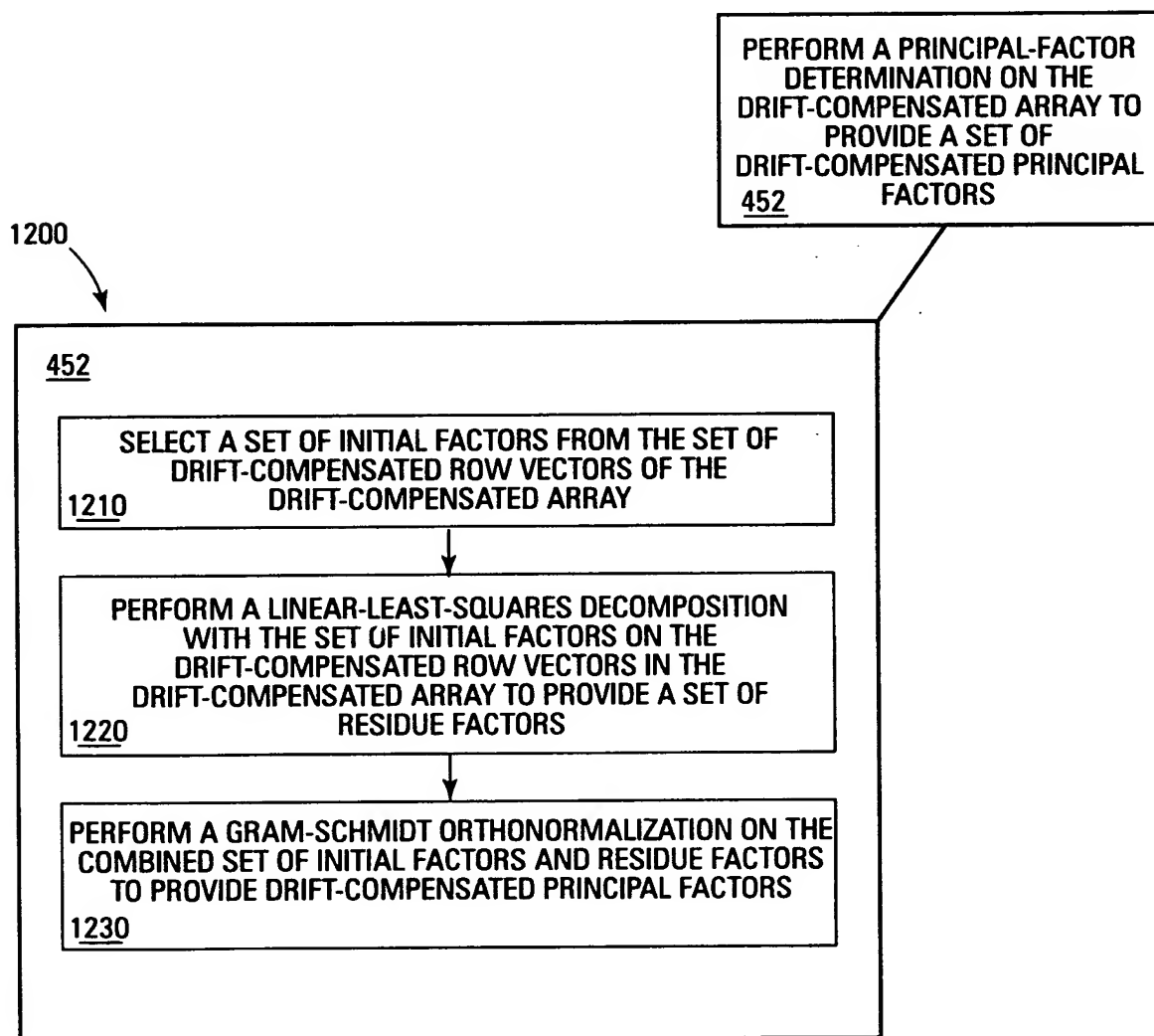


Fig. 12

15/26

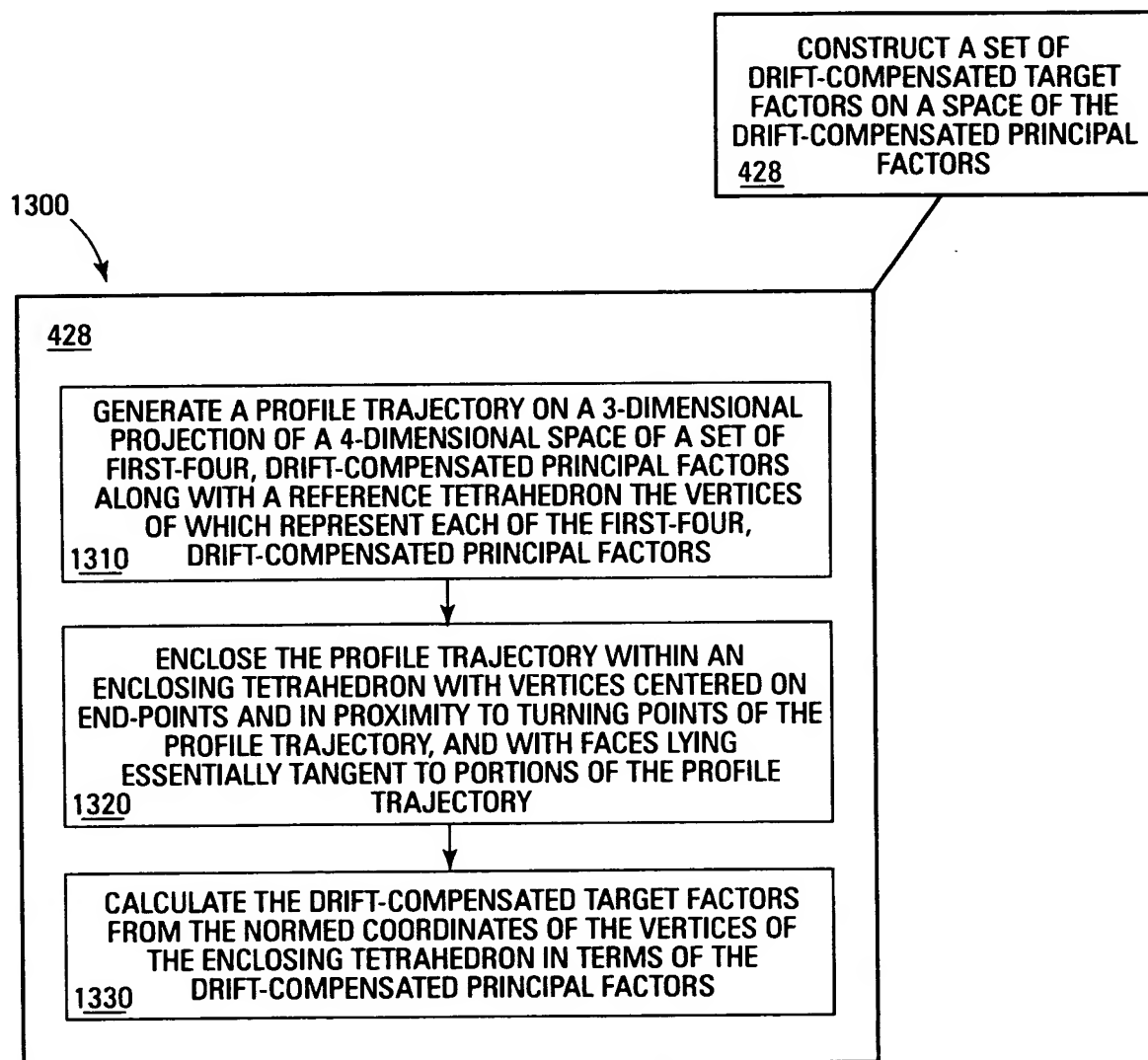


Fig. 13

16/26

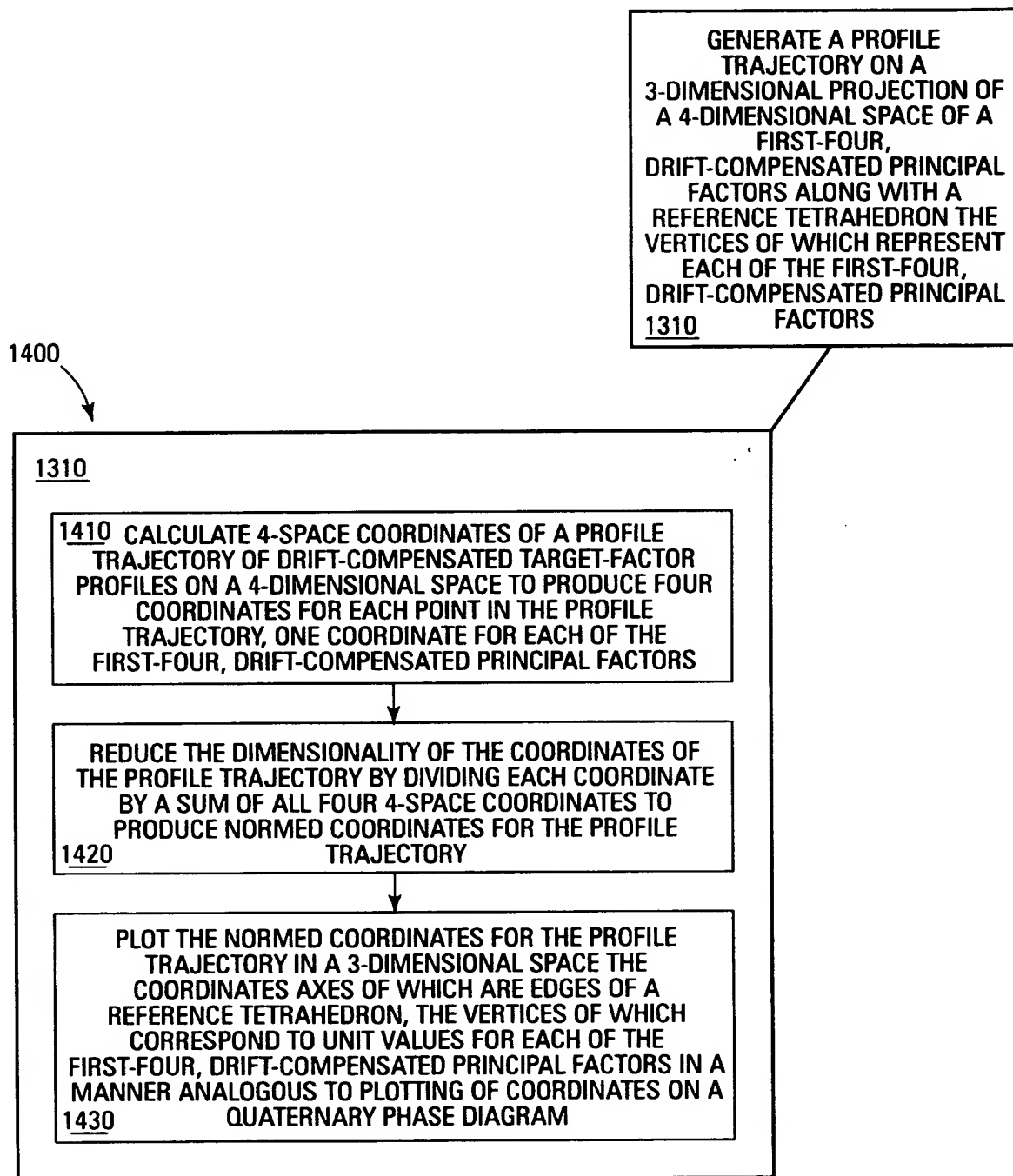


Fig. 14

ENCLOSE THE PROFILE TRAJECTORY WITHIN AN ENCLOSING TETRAHEDRON WITH VERTICES CENTERED ON END-POINTS AND IN PROXIMITY TO TURNING POINTS OF THE PROFILE TRAJECTORY, AND WITH FACES LYING ESSENTIALLY TANGENT TO PORTIONS OF THE PROFILE TRAJECTORY; AND, CALCULATE THE DRIFT-COMPENSATED TARGET FACTORS FROM THE NORMED COORDINATES OF THE VERTICES OF THE ENCLOSING TETRAHEDRON IN TERMS OF THE DRIFT-COMPENSATED PRINCIPAL FACTORS

1320 & 1330

1500

1320 & 1330

PLACE VERTICES OF AN ENCLOSING TETRAHEDRON AT LOCI OF HEAVY POINT CONCENTRATIONS OF A PROFILE TRAJECTORY

1510

ADJUST THE EDGES OF AN ENCLOSING TETRAHEDRON TO LIE ALONG ESSENTIALLY STRAIGHT LINE SEGMENTS

1520

PLACE REMAINING VERTICES OF AN ENCLOSING TETRAHEDRON SO AS TO LIE NEAR THE TURNING POINTS OF THE PROFILE TRAJECTORY

1530

ADJUST THE FACES OF THE ENCLOSING TETRAHEDRON TO LIE ALONG CURVED SEGMENTS JOINING A TURNING POINT AND ESSENTIALLY STRAIGHT LINE SEGMENTS OF THE PROFILE TRAJECTORY

1540

Fig. 15

18/26

1600




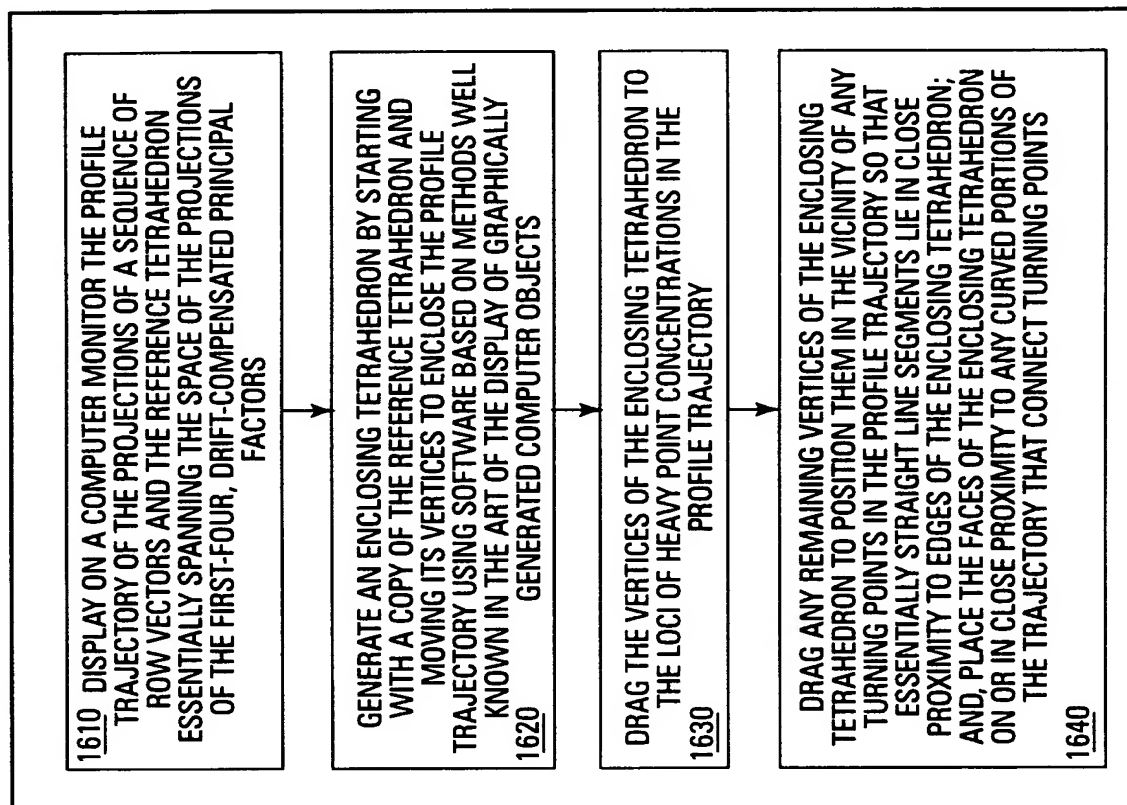
Fig. 16a

Fig. 16b

Fig. 16

19/26

Fig. 16a



20/26

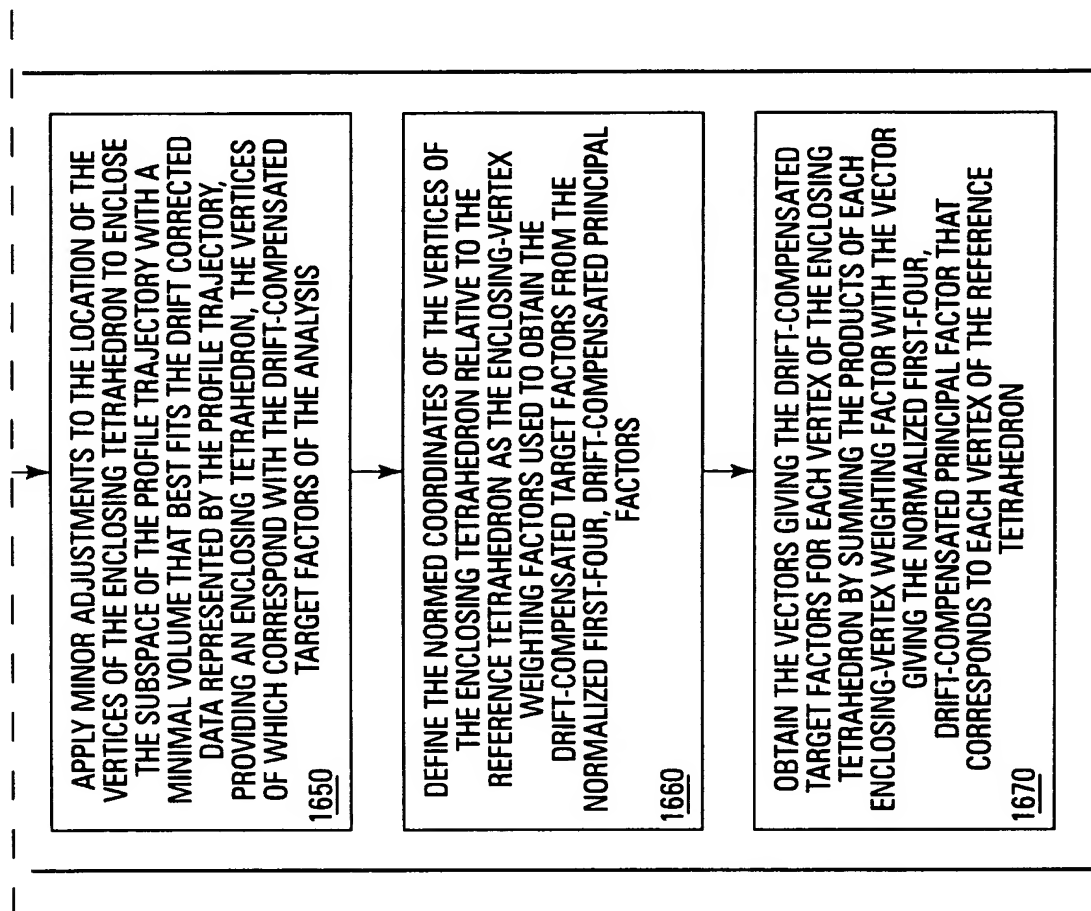


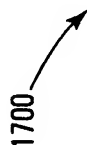
Fig. 16b

Fig. 17

Fig. 17a

Fig. 17b

1700



22/26

Fig. 17a

OUTPUT ANALYTICAL RESULTS
SELECTED FROM THE GROUP
CONSISTING OF A SET OF
DRIFT-COMPENSATED SCALED
TARGET-FACTOR PROFILES
DERIVED FROM THE SET OF
TARGET-FACTOR WEIGHTING
FACTORS, AND THE SET OF
DRIFT-COMPENSATED TARGET
FACTORS

436

436

OBTAIN THE SET OF DRIFT-COMPENSATED TARGET-FACTOR
PROFILE VALUES BY APPLYING THE SET OF
DRIFT-COMPENSATED TARGET FACTORS TO THE PROFILE
TRAJECTORY BY ASCERTAINING THE NORMED
COORDINATES OF EACH POINT ON THE PROFILE
TRAJECTORY, I.E. THE TARGET-FACTOR WEIGHTING
FACTORS, FROM THE ENCLOSING TETRAHEDRON IN A
MANNER ANALOGOUS TO FINDING COORDINATES OF A
POINT ON A QUATERNARY PHASE DIAGRAM

1710

COMPOSE A REFERENCE VECTOR BY SUMMING THE
PRODUCTS FROMED BY MULTIPLYING THE VECTORS
CORRESPONDING TO THE DRIFT-COMPENSATED TARGET
FACTORS BY THE TARGET-FACTOR WEIGHTING FACTORS,
FOR EACH POINT ON THE PROFILE TRAJECTORY

1720

SCALE THE AMPLITUDE OF THE RESULTING REFERENCE
VECTOR TO OPTIMALLY MATCH THE CORRESPONDING ROW
VECTOR COMPENSATED FOR THE EFFECTS OF DRIFT

1730

23/26

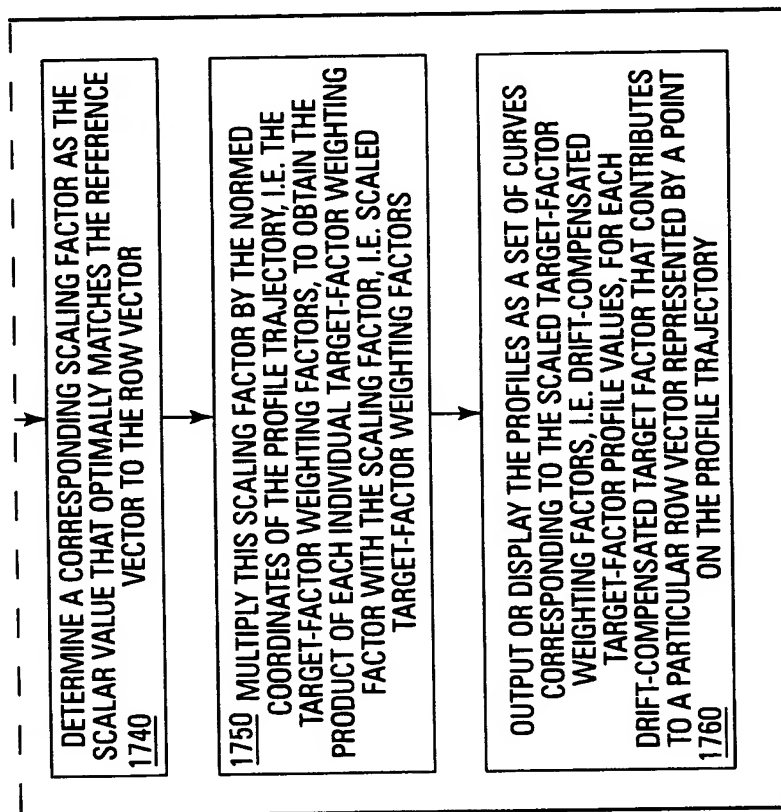


Fig. 17b

24/26

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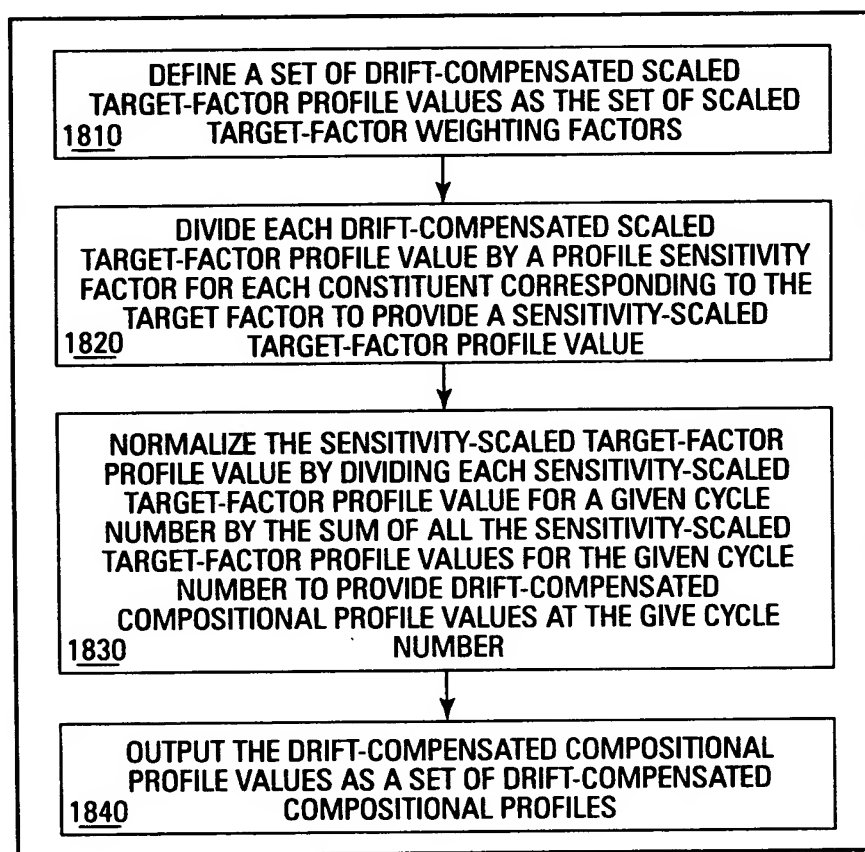


Fig. 18

25/26

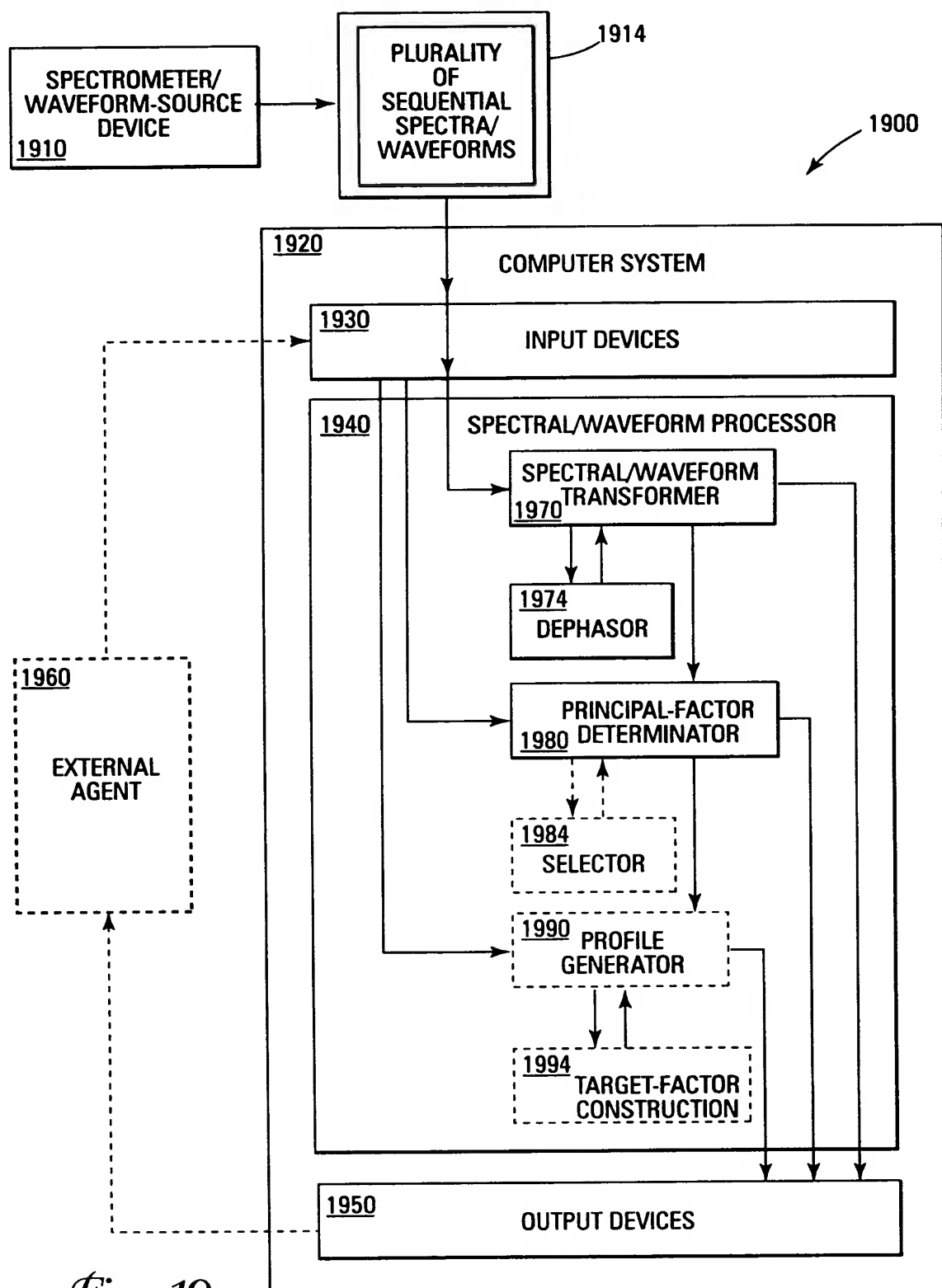


Fig. 19

26/26

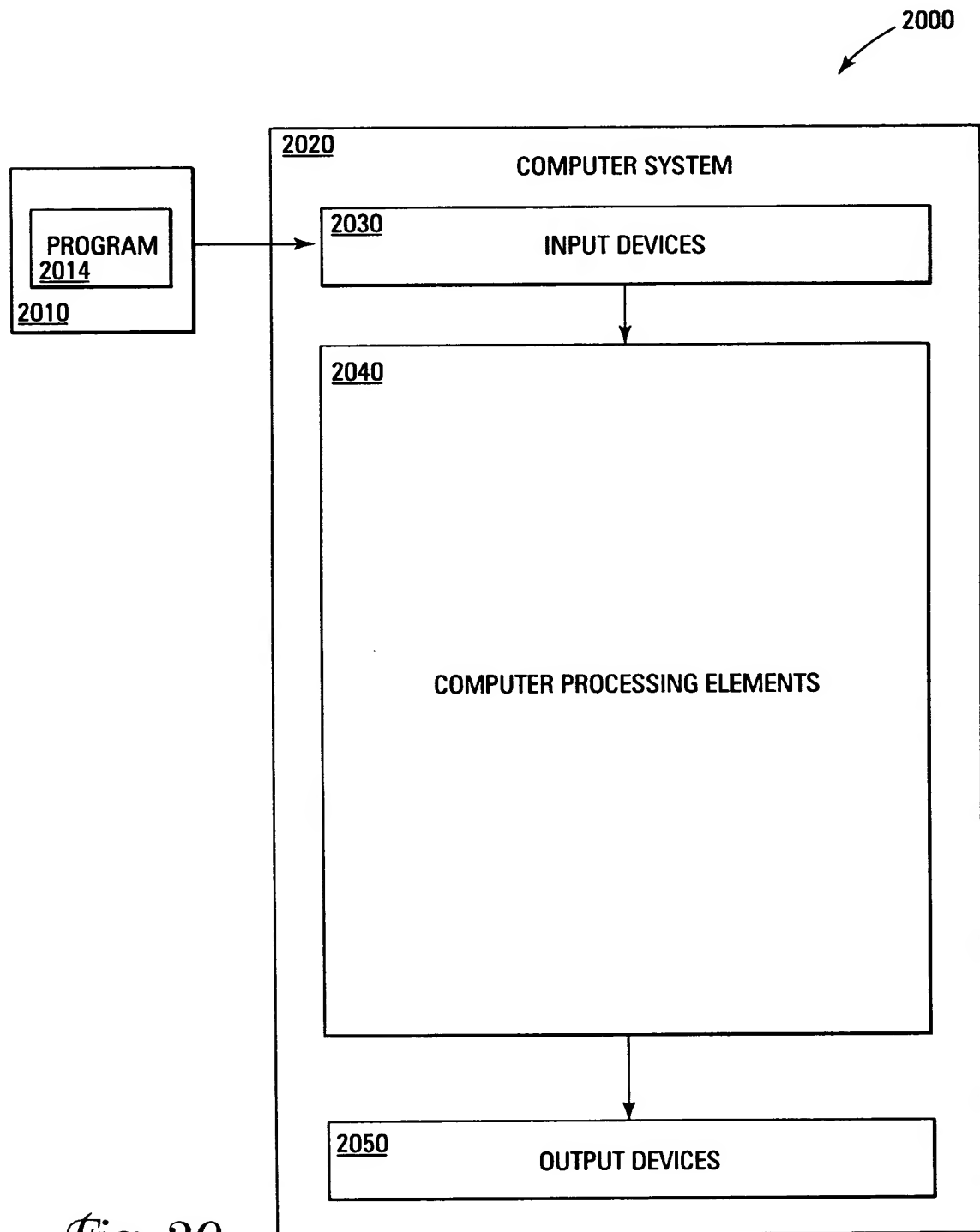


Fig. 20